Catalogue of American Amphibians and Reptiles.

Verdade, L.M. and C.I. Piña. 2006. *Caiman latirostris*.

Caiman latirostris (Daudin)
Broad-snouted Caiman

Crocodilus latirostris Daudin 1801 [1802]:417. Type-locality not given, restricted to "Joinville, Sta. Catarina, Brazil" by Freiberg and de Carvalho (1965). Holotype, Museum National d'Histoire Naturelle (MNHN) 7769, juvenile (85 cm), collected by J. de Jussieu, sex and date of collection undetermined (not examined by authors). See **Comment**.

Caiman fissipes Spix 1825:4 (= *Crocodilus latirostris* Daudin 1801 [1802], by subsequent designation of Schmidt 1928:207).

C[rocodilus]. sclerops: Wied 1825:69 (not of Schneider

Alligator sclerops: Gray 1831:62 (part).

Crocodilus (*Alligator*) *fissipes*: Cuvier 1829:23.

Champsa fissipes: Wagler 1830:plate 17.

Alligator cynocephalus: Dumeril and Bibron 1836:86. Nomen substitutum for *Caiman fissipes*.

Caiman fissippède: Dumeril and Bibron 1836:86. *Lapsus*.

Jacare fissipes: Gray 1844:64.

Alligator fissipes: Reinhardt and Lütken 1861:234.

Jacare latirostris: Gray 1862:328 (part).

Alligator latirostris: Strauch 1866:19, 73.

Jacare (*Cynosuchus*) *latirostris*: Gray 1873:109.

A. fissipes (*latirostris*): Lütken 1884:78.

A[lligator]. (*J[acare].*) *latirostris*: Lütken 1884:79.

Caiman latirostris: Boulenger 1889:293. First use of combination.

Proalligator australis (Brav.): Ambrosetti 1890:409–414.

Jacaretinga latirostris: Vaillant 1898:171.

Caiman latirrostris: Gabe, Martoja, and Saint Girons 1964:309. *Lapsus*.

Caiman latirostris chacoensis Freiberg and de Carvalho 1965:354. Type-locality, "Estero El Perdido y Río Bermejo (cerca de El Zapallar), Chaco [Argentina]." Holotype, Museo Argentino de Ciencias Naturales, Buenos Aires (MACN) 17.551, fossil skull, collected by Antonio Amigo and Joaquín Nazara, August 1939 (examined by authors). See **Comment**.

Caiman latirostris latirostris: Freiberg and de Carvalho 1965:354. See **Comment**.

• **CONTENT**. *Caiman latirostris* is a monotypic species (see **Comment**).

• **DEFINITION**. *Caiman latirostris* is a medium-sized crocodilian, reaching a maximum total length of 3.5 m, but animals longer than 2.0 m are now rare in the wild (Verdade 1998). The snout is proportionatly broader than in other crocodilians. It tilts upward at the nose, and has a ridge that runs down the center. The body is dark green, with darker spots on the head and neck. There are heavily ossified ridges run-

Figure 1. Adult *Caiman latirostris* (photograph by A. Larriera).

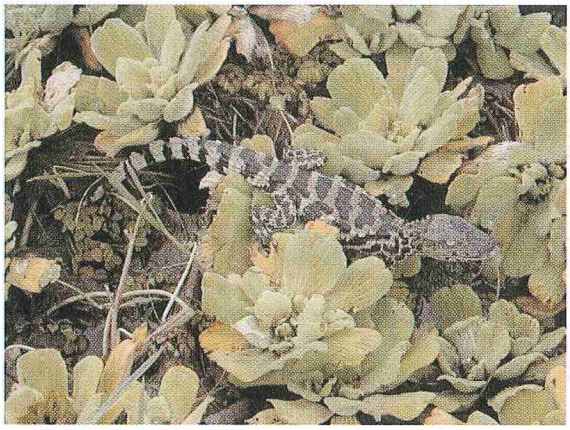


Figure 2. Hatchling *Caiman latirostris* (photograph by C.I. Piña).

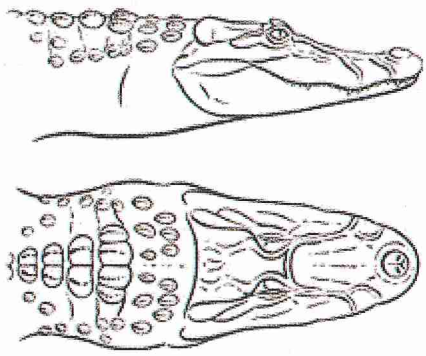
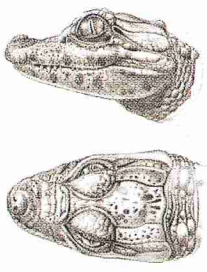


Figure 3. Head and neck of adult *Caiman latirostris* (above; Minister of Supply and Services Canada, (1995); head of a four month old hatchling (below).



ning along the back (Brazaitis 1974). The skin does not have integumentary sensory organs, but full double osteoderm buttons are present. Transverse ventral scale rows number 26 to 30 with a double ventral collar. The highest points of the ventral scales are located at the centers of the scales. Laterally, rows of large oval scales alternate with a net of irregularly shaped small scales and creases (King and Brazaitis 1971, Fuchs 1974a,b).

• **DESCRIPTIONS**. Descriptions are provided by Natterer (1840), Mook (1921), Schmidt (1928), Wermuth and Mertens (1961), Brazaitis (1973), King and Burke (1989), and Ross and Magnusson (1989). Descriptions of commercial skins are given by King and Brazaitis (1971), Fuchs (1974a), and Wermuth and Fuchs (1983a).

• **ILLUSTRATIONS**. Color photographs and line drawings of many life-history stages are in Anonymous (1983) and Palermo (1985). Halftone illustrations of head and neck have been made by Natterer (1840) and Lafleur et al. (1995), and of scale patterns by de Carvalho (1951). Lafleur et al. (1995) provide a line drawing of an adult animal. Line drawings of the skull have been published by Wermuth (1953) and Wermuth and Mertens (1961), of the head and neck by Wermuth and Fuchs (1983b), and of wrist bones by Novas (1989). Ross and Magnusson (1989) present a colored drawing of an adult. Medem (1983) presents black-and-white photographs of skulls and colored photographs of captive adult animals at São Paulo Zoo. Larriera and Verdade (1995) provide a colored photograph of eggs and a hatchling, and the head of a living adult. Verdade (1998) present a black-and-white photograph of a nesting female. Fuchs (1974a,b) and Wermuth and Fuchs (1983c) provide photographs of commercially tanned skins. A color distribution map is in Anonymous (1983). Color photographs are in Achaval and Olmos (1997, 2003) and Freitas and Pavie (2002).

Map. Distribution of *Caiman latirostris*. The type-locality is too imprecise to plot; dots indicate other records.

• **DISTRIBUTION**. *Caiman latirostris* inhabits a wide latitudinal range, from 5° S to 34° S. Its geographic distribution is restricted to eastern South America including northern Argentina (provinces of Corrientes, Chaco, Entre Ríos, Formosa, Jujuy, Misiones, Salta, and Santa Fe; Piña et al. 2004), eastern Brazilian States of Rio Grande do Sul (Melo 2002), Santa Catarina (Frieberg and de Carvalho 1965), Paraná (Morato 1991), São Paulo (Verdade 1997b), Rio de Janeiro (Rocha et al. 2000), Minas Gerais (Machado et al. 1998), Espírito Santo, Mato Grosso do Sul (Mourão and Campos 1995), Goiás (Verdade pers. obs.), Bahia, Sergipe, Alagoas, Pernambuco, Paraíba, and Rio Grande do Norte (Verdade 2001c), northern Uruguay (departments of Artigas, Salto, Paysandú, Rocha, Tacuarembó, Cerro Largo and Lavalleja; Achaval 1987, Borteiro pers. obs.), southern Bolivia (Pilcomayo River and Beni Department; Pacheco and Aparicio 1996), and southern Paraguay (Scott et al. 1990, King et al. 1994). The species has been reported from the coastal island "Ilha do Cardoso" in southern Brazil (Moulton 1993, Moulton et al. 1999). *Caiman latirostris* is a highly aquatic species found primarily in densely vegetated and quiet waters including marshes, swamps and in mangroves along the Brazilian Atlantic coast (Medem 1983). The species also occurs in cattle water reservoirs throughout its range (Scott et al. 1990, Piña and Larriera 2003, Venturino 1994, Verdade and Lavorenti 1990). It can be found from sea level to 600 m in the state of Paraná, Brazil (Morato 1992). The geographic range partially overlaps that of *Caiman yacare*, but hybrids have yet to be described.

• **FOSSIL RECORD**. There are Miocene fossil records of the species near Paraná City, Entre Ríos Province, and in Agua Blanca, Salta Province, Argentina, dated as 6–9 million years of age (Cione et al. 2000). Recent fossils of *C. latirostris* have been found in La Venta, Huila, Colombia (Langston 1965, Gasparini 1981). Báez and de Gasparini (1979) discussed the South American fossils known at that date.

• **PERTINENT LITERATURE**. The references below cover various aspects of the species biology: **anatomy and morphology** (Duvernoy 1836, Fisher 1981, Huxley 1860, Müller 1924, Kälin 1933, Nickel 1960, Gabe et al. 1964, Iordansky 1973, Petrovicky 1973, Soule 1987, Carpenter and Lindsey 1980, Fisher 1981, Ross and Mayer 1983, Fiorentin and Gehrke-Friederich 1984, Aoki 1989, Novas 1989, Walker 1990, Ono et al. 1991, Manzani et al. 1993, Monteiro and Soares 1997, Monteiro et al. 1997, Verdade 1997b, Monteiro and Lessa 2000, Verdade 2000, Suzuki et al. 2002, 2003, and Verdade 2003);

anthropology (Guggisberg 1972, Costa-Neto 1999, de Almeida et al. 2002, and Alves and Rosa 2006); **behavior** (Widholzer and Melo 1983, Astor 1985, Verdade 1992a, 1999, Piña et al. 2000, Piffer and Verdade 2002, Trinca and Guix 2003, Verdade et al. 2006); **biochemistry** (Barbosa et al. 2005c, Coulson and Hernandez 1971, de Faria et al. 1976, De Smet 1978, Dessauer et al. 1957, Herbert 1968, Herbert et al. 1966, Hernandez and Coulson 1967, 1968, 1971, Krückert et al. 2006, Nolly and Fasciolo 1972, Pye et al. 2001, Rider and Bartel 1967, Schroeder et al. 1990, Siroski et al. 2000, Troiano et al. 1997, Trosero et al. 2005, and Yamada et al. 1987, 1991); **blood vessels or hematology** (Reischl and Diefenbach 1976, Daniel 1984, Garcia et al. 1993, Tourn et al. 1994a,b, Troiano and Althaus 1994, Troiano et al. 1996, 1998, Villar et al. 2003, and Barbosa et al. 2005a,b); **conservation and management** (Behler 1989, Brazaitis et al. 1996, 1997, Collins and Knight 1979, Crea 1986, Crea et al. 1986, Dixon and Yanosky 1993, Fuchs 1971, 1974a, Reed et al. 2003, Rocha e Silva 1981, Taber et al. 1997, Widholzer et al. 1981, Groombridge 1983, Gudynas 1985, Larriera 1990a, 1991b, 1992a-c, 1993a-c, 1994a,b, 1998, Lavilla et al. 2000, Melo 1993, Michelotti et al. 1992, Monsores et al. 1992, Rangel et al. 1992, Rocha and Molina 1992, Ruschi 1954, Thorbjarnarson et al. 1992, U.S. Fish and Wildlife Service 1986, Vanzolini 1972, Verdade and Lavorenti 1990, 1992, Sajdak et al. 1993, Verdade et al. 1993b, Villalba-Macías 1987, 1993, Zaccagnini and Venturino 1993, Magnusson 1994, 1995, Ríos et al. 1994, Yanosky and Mercolli 1994, Micucci and Waller 1995, Pacheco and King 1995, Larriera et al. 1996b, Pacheco 1996, Pacheco and Aparicio 1996, Verdade 1997a, Whatmore and Thorne 1998, Larriera and Imhof 2000, Loiselle et al. 2001a,b, Sarkis-Gonçalves et al. 2001, 2002b, 2004, 2005, Verdade 2001b,c, Fincatti and Verdade 2002, Uhart and Milano 2002, Fischet et al. 2003, Ashley 2004, Larriera and Imhof 2004, Velasco 2004, Cardoso et al. 2004, Chuburu et al. 2004, Prado 2005b, Siroski and Larriera, 2005, Velasco and De Sola 2005, and Rey et al. 2006); **diseases and parasites** (Aquino-Shuster and Duszynski 1989, Brooks and O'Grady 1989, Brown et al. 2001, 2004, Campbell 2003, Carini and Biocca 1940, Dollfus 1935, Dubois 1936, Heymons 1941a,b, Hughes et al. 1942, Jacobson 2002, Martin et al. 2002, Ramos et al. 1992, Rossetti et al. 2003, Sprent 1979, Troiano and Roman 1996); **ecology and natural history** (Achaval and Olmos 1997, 2003, Achaval et al. 1993, Anonymous 1983, Aquino 1994, Berst 1945, Bucher 1980, Burmeister 1861, 1880, Gallardo 1980, Greer 1971, Larriera 1995, Larriera and Verdade 1995, Larriera et al. 1992, Loiselle et al. 2000, Moreno-Bejarano and Álvarez-León 2003, Rebelo and Louzada 1984, Scott et al. 1990, Starck et al. 2002, Verdade 1998, Verdade and Larriera 2002, Waller and Micucci 1993a, Werner 1902, Yanosky 1990, 1994, 1995); **embryology** (Donayo et al. 1998, 2002); **evolution and genetics** (Amavet et al. 2004, 2005, Cohen and Gans 1970, Dessauer et al. 1957, Gasparini 1973, Densmore and White 1991, Brochu 1997, 1999, Kordis and Gubensek 1998, Lutzoni et al. 2000, Lovsin et al. 2001, Verdade et al. 2002, Villela 2004, Zucoloto 1998, 2003, Zucoloto et al. 2002, 2006); **growth, body size, and morphometrics** (Schmidt 1944, Vogel 1958, Wermuth 1964, Leonardi 1984, Larriera 1990b, Larriera and Aguinaga 1990, Larriera et al. 1990, Verdade and Santiago 1990, Larriera and Del Barco 1992, Verdade and Santiago 1993, Vianna et al. 1995a, Pinheiro 1996, Piña et al. 1996b, Moulton et al. 1999, Sarkis-Gonçalves 2000, Pinheiro and Lavorenti 2001, Piña and Larriera 2002, Sarkis-Gonçalves et al. 2002a, Prado et al. 2005); **karyotypes** (Amavet et al. 2000, 2002, 2003, Gilboa 1975, Gorman 1973, Lui et al. 1994, Olmo 1984); **longevity** (Bowler 1977, Flower 1925, Conant and Hudson 1949); **phylogenetics** (Aggarwal 1994, Brochu 2001, 2003, 2004, Bromham et al. 2002, Gatesy et al. 2003, 2004, Hass et al. 1992, Merchant et al. 2005, Norell 1988); **physiology** (Aprison et al. 1969, Brazda et al. 1965, de Souza Santos et al. 1953, Grigg et al. 1998, Hernandez et al. 1973, Jackson 2004, Jackson et al. 2003, Larriera et al. 1996a, 2000, Parra Miranda 2003, Peyrethon and Dusan-Peyrethon 1969, Piña et al. 1996a, 1997, 2002, 2005, Santolaya and Bertini 1970, Schleich and Kästle 1986, Skovgaard et al. 2005, Stoker et al. 2003, Tattersall et al. 2006, Thorbjarnarson 1996, Vaz-Ferreira and Sierra de Soriano 1960, Vianna et al. 1995b); **populations** (Waller 1987a, Yanosky 1992, Waller and Micucci 1992a, 1993b, 1994, Mourão et al. 1994a,b, Venturino 1994, Mourão and Campos 1995, Guix et al. 1997, Siroski 2004, Micucci and Waller 2005, Prado et al. 2005a); **reproduction** (Greer 1970, Braun 1973, Silva and Antas 1980, Rocha e Silva and Zuquin de Antas 1981, Tesche et al. 1981, Achaval and González 1983, Vaz-Ferreira and Achaval 1986, Widholzer et al. 1986, Larriera 1988, 1991a, De la Peña 1991, Larsen et al. 1992, Vac et al. 1992, Verdade et al. 1992a,c, 1993a, 2003, Shwedick 1993, Larriera 1994c, Larriera and Imhof 1994, Campos and Mourão 1995, Verdade 1992b, 1995, 2001a, Imhof et al. 1996, Piña 1996, 1998, Verdade and Sarkis-Gonçalves 1998, Piña and Donayo 2000, Larriera 2002, Piña 2002b, Piña et al. 2003, Larriera et al. 2004, 2006); **systematics and taxonomy** (Benton and Clark 1988, Boie 1826, Wagler 1833, Boulenger 1886, Guibé 1970, Siebenrock 1905, Mook and Mook 1940, Mertens 1949, de Carvalho 1951, Schmidt and Inger 1951, Wermuth 1953, Medem and Marx 1955, Wermuth and Mertens 1961, Freiberg and Carvalho 1965, Brazaitis 1973, Steel 1973, Coulson and Hernández 1983, Densmore 1983, Medem 1983, Meneghel et al. 1989, Grenard 1991, Yamashita et al. 1993, Poe 1996); **thermoregulation** (Bassetti, 2002, Bassetti et al. 2005, Diefenbach 1988, Olegario and Diefenbach 1988, Sajdak and Molina 1992, Molina and Sajdak 1993, Verdade et al. 1994, Piña 2002a); **trophic relationships** (Aquino 1988, Diefenbach 1979, Verdade et al. 1990, 1992b, Melo 1992, Hill et al. 1997, Larriera and Piña 2000, Schubart 1947, Vianna 2000, and Piña and Larriera 2003); **zoogeography** (Warming 1892, Koslowsky 1893, von Ihering 1898, Schenkel 1901, Heilprin 1907, Warming 1908, Masi 1910, Lampe

1911, Bertoni 1913, Marelli 1924, Luederwaldt 1926, Müller and Hellmich 1936, Freiberg 1939, Schmidt 1945, Ringuelet and Aramburu 1957, Gerzenstein and Muñoa 1958, Roig and Cei 1961, Ruschi 1966, Müller 1971a,b, Neill 1971, Brazaitis 1973, Achaval 1976, 1977 1987, 1989, 1997, 2001, Ribeiro 1976, Gallardo 1977, 1979, Lema and Fabian-Beurmann 1977, Fitch and Nadeau 1980, Melgarejo 1980, Gallardo 1982, Gomes and Krause 1982, Groombridge 1982, 1987, Achaval and San Martín 1983, Belluomini and Autuori 1983, Lema et al. 1984, Morais and Morais 1987, Waller 1987b, King and Videz-Roca 1989, Ross and Magnusson 1989, Taplin and Grigg 1989, Ergueta and Pacheco 1990, Waller and Micucci 1992b, Yanosky and Mercolli 1995, Souza and de Freitas 1998, Morrone 2001). This species occurs in the following **checklists, keys, and similar compendia:** (Cope 1861, 1899, Gray 1867, 1872, Boulenger 1885, Flower 1929, Marelli 1931, Staton 1978, Hoogmoed and Gruber 1983, Scheidt 1990, Verdade and Santiago 1991, 1992, Vanzolini 1993, Verdade and Kassouf-Perina 1993, Verdade and Molina 1993, Nomura 1996, Corrêa da Costa et al. 1999, de Lema 2002, Lescure et al. 2002, Araujo Gussoni 2003, Walsh 2004, dos Santos et al. 2005, Andreone et al. 2005).

• **ETYMOLOGY**. The name *latirostris* is derived from the Latin "lati" (broad, wide) and "rostris" (snout or rostrum) and refers to the wide snout of the species, proportionally the widest of the extant crocodilians.

Common names applied to this species include overo, ururan, yacaré de hocico ancho, yacaré overo, yacaré ñato, yacaré rubio, (Argentina, Paraguay and Uruguay), jacaré mariposa, jacaré-de-papo-amarelo, jacaré verde (Brazil), urara-u, yacaré pytá, yacaré say-yu (Brazil and Paraguay). Common names have also been listed by Fernandez-Barran and Freiberg (1951) and Foote (1978).

• **COMMENT**. Freiberg and de Carvalho (1965) designated a neotype for this species, but did not provide any justification for this action. Since the type specimen is still extant, such a designation is invalid under Article 75 of the International Code of Zoological Nomenclature (King and Burke 1989). The restricted type-locality is likewise invalid. They described two subspecies for *Caiman latirostris* (*C. latirostris latirostris* and *C. latirostris chacoensis*). These two taxa were discussed in terms of head morphology, osteology and scute pattern (Crea et al. 1986). Although Medem (1983) adopted this designation, it was widely rejected by other authors. Gasparini (1973) synonymized the following taxa under *Caiman latirostris*: *Crocodylus* sp. Bravard (1858); *Proalligator australis* (Brav.) Ambrosetti 1887; *Alligator australis* (Brav.) Rovereto 1912; *Alligator lutescens* Rovereto (1912); *Xenosuchus lutescens* (Rov.) Rusconi 1933; *Caiman paranensis* (Scal.) Patterson 1936; and *Caiman lutescens*, Langston 1965. Hoogmoed and Gruber (1983) discussed the name *Caiman fissipes* Spix 1825, and concluded that it is a synonym of *C. latirostris*. Piña and Argañaraz (2000) proposed *C. lutescens* to be a valid species, and not a synonym of *C. latirostris*, based on jaw shape and size.

An experimental program in captive breeding of *Caiman latirostris* began in 1988 at the University of São Paulo, Brazil (Verdade 1997a, 2001a). This captive colony has been documented in a Regional Studbook (Verdade and Santiago 1991, Verdade and Molina 1993, Verdade and Kassouf-Perina 1993) including the use of genetic markers for parentage tests (Zucoloto et al. 2002). In the early 1990s the program started to survey the remaining wild populations of the species in Brazil (Verdade 1998, 2001d, Verdade et al. 2002). In 1997, the captive breeding program began to furnish adults to farmers in order to establish a farming program in southeastern Brazil, which is still operating to date. In Santa Fe, Argentina, a self-recovering population program began in 1990. As a result, thousands of eggs have since been collected and artificially incubated, and thousands of hatchlings have been released to the wild (Larriera 1990a). In the late 1990s the current ranching program began to operate successfully (Larriera 1998). *Caiman latirostris* is currently listed in Appendix I of CITES (although the Argentine population was moved to Appendix II in 1997, CITES 1997) and "Low Risk, Least Concern" in the IUCN Red List (IUCN 2000).

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